

*Waterloo Region
Partners For Clean Air*



Clean Air Plan Report 2005 / 2006

June 6, 2006

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Preamble

Air pollution is an important environmental, health and quality of life concern for citizens of this region as the associated negative impacts can be significant. This document is the first annual report on activities of a diverse partnership which aims to positively affect this important issue through collective actions under the new Clean Air Plan.

The original Clean Air Plan was developed in 1999 by a variety of stakeholders including the Citizen's Advisory Committee on Air Quality (Waterloo Region). The Plan was endorsed by the Region of Waterloo and adapted by area municipalities. For the next five years the Plan functioned as a guiding document and influenced operations in each municipality with short and long-term strategies aimed at reducing air emissions.

In the Fall of 2004, Region of Waterloo Public Health staff proposed a review of the Plan and established a partnership to develop an updated Clean Air Plan specifically for organizations. The Waterloo Regional Partners for Cleaner Air was brought together in early 2005 in order to:

- review and revise the 1999 Clean Air Plan
- improve local air quality through reduced air emission from partner organizations
- provide a supportive forum for partners to share information

The new Clean Air Plan, as well as the partnership, is dynamic in nature and therefore will continue to evolve over time as new partners join the initiative and the potential for collaborative initiatives are explored. Other influences may include advances in technology which may present new emission reduction opportunities for the different partners operations.

Each partner has primary responsibilities to the people that they serve, and are faced with challenges unique to their sector in delivering mandated programs and services while trying to lessen their environmental impact. Since this partnership is voluntary, the commitment of participants in this ongoing initiative should be considered exemplary as they are taking a leadership role to improve the air quality in Waterloo region. It is hoped that the leadership demonstrated will reap positive dividends throughout the community as the initiative progresses and perhaps influences other organizations to follow suit.

Waterloo Region Partners for Cleaner Air

The organizations listed below, as of April 2006, have developed and support in principle the new Clean Air Plan. In addition, the Chairperson of the Citizen's Advisory Committee on Air Quality has been consulted during the Plan's revision process.

The City of Cambridge

The City of Kitchener

The City of Waterloo

Conestoga College

The Region of Waterloo

St. Mary's General Hospital

Waterloo Region District School Board

Wilfrid Laurier University

Further details regarding the terms of reference for participation in this partnership, as well as recruitment of new partners, are included in the following pages of this report. In addition, information regarding other process issues associated with the Clean Air Plan and the partnership are captured in the accompanying Region of Waterloo Public Health staff report to their Community Services Committee as an update on progress since the October 18, 2005 report to Committee.

Waterloo Region Partners for Clean Air Terms of Reference

Committee Mission

To work together to improve the outdoor air quality of Waterloo Region by reducing air emissions generated by our own organizations and supporting the non-member organizations to do the same.

Scope of Committee Activities

Provide a supportive forum for organizations to share best practices, best principles, and knowledge.

Explore tools to assist members in quantifying their air emissions from operations which will help move towards setting emission reduction targets and timelines that are achievable, but ambitious.

Support educational initiatives which address emission reductions in our community and encourage non-member organizations to reduce outdoor air emissions.

Committee Deliverables

Revise and update the Waterloo Region Clean Air Plan (1999) to set a framework of continuous improvement and cooperative efforts to be captured in an annual report.

Include an air quality component within environmental plans and appropriate committees for each of the member organizations where most feasible.

Establish a format (table) and units of measure for standardized reporting of emission reductions.

Terms of Reference

(Continued)

Committee Membership

Membership is open to public agencies, institutions and organizations, who wish to adopt measures that will improve outdoor air quality in Waterloo Region and support the Waterloo Region Clean Air Plan. The committee will consider the inclusion of businesses and others on the committee at a later date. Membership on the committee should not exceed 20 partners.

Region of Waterloo Public Health will initially chair the committee and provide administrative support. The Committee Chair, Terms of Reference, and membership will be reviewed annually.

The Committee will establish deliverables and generally move items forward by achieving consensus.

Waterloo Region Clean Air Plan (2006)

Clean air is important to the health and sustainable development of Waterloo Region. Unfortunately, the quality of outdoor air experienced in this region has often been at levels that can impact health. Finding solutions to improve our air quality is important to protect the health of our community and the health of our environment. Widespread efforts are needed to reduce air contaminants to help protect and improve the air we breathe. These efforts may also lead to improved efficiencies and reduced financial costs to organizations.

There is significant opportunity for organizations in Waterloo Region to share their knowledge and expertise around improving air quality and how to creatively reduce, or in some cases, eliminate identified emissions. Understanding that each organization in Waterloo region has their own air emission profile and their own opportunities for reducing their impact on our air shed, a balance between collective action and individualized approaches is needed.

To that end the members of the Waterloo Region Partners for Clean Air Committee agree to support the committee's mission to work together to improve the outdoor air quality of Waterloo Region by reducing air emissions generated by their own organization. In participating on the committee the members agree to do the following:

- Participate in the scope of committee activities and work towards the deliverables including annual reporting of emission reduction initiatives
- Share knowledge and expertise with committee members
- Include an air quality component within environmental plans and appropriate committees for each of the member organizations
- Demonstrate continual improvement towards emission reduction by adopting appropriate options as identified by the committee on an ongoing basis

(see Table 1)

TABLE 1

| CATEGORY | EMISSION REDUCTION OPTIONS | INDICATORS |
|-----------------------------|------------------------------------|-------------------------------|
| Fleet and support equipment | Fuel reduction monitoring | consumption L/vehicle |
| | Management technologies | yes/no |
| | Fuel switching | % of vehicles |
| | Equipment retrofits | % of vehicles |
| | Vehicle/unit efficiency upgrades | # of vehicles |
| | Refueling schedule | yes/no |
| | Advanced maintenance | yes/no |
| Buildings | Building energy management | kWh consumed |
| | Lighting retrofits | kWh saved |
| | HVAC retrofits | kWh saved |
| | Building envelope retrofit policy | yes/no |
| | Equipment upgrades | # energy star equipment added |
| | Demand management education | yes/no |
| | Alternative energies | type and kWh supplied |
| | New building design | standards (e.g. LEED) |
| Employee transportation | Transit subsidies | # employees purchasing |
| | Carpooling program | # employees participating |
| | Active commuting promotion | # employees participating |
| | Parking disincentives | yes/no |
| | Telecommuting policy | # employees participating |
| Education | Employee education program | # employees participating |
| | Public education | # events |
| | Anti-idling education | yes/no |
| | Driver education (efficiency) | yes/no |
| Other policies or programs | Participation in external programs | yes/no |
| | Anti-idling policy | yes/no |
| | Audits/inventories/evaluations | yes/no |
| | Green purchasing | yes/no |
| | Community program support | yes/no |
| | Development design | yes/no |
| | Landscaping/xeriscaping | yes/no |
| | Natural lands conservation | yes/no |
| | Internal clean air plan | yes/no |
| Forestry Development | # of trees planted | |

Annex: Success Stories from 2005

The City of Cambridge

Cambridge staff have participated in several external programs over the past year such as:

- The One-Tonne Challenge of Waterloo Region addressing reduction of Greenhouse Gases;
- The Citizen's Advisory Committee on Air Quality (Waterloo Region), and;
- The City Green Strategy, a community volunteer based sub-committee of the Cambridge Environmental Advisory Committee which promotes collective action, public involvement and environmental education.

In managing their own corporate air emissions, the City employs fleet initiatives such as use of alternative fuels and conducting advanced maintenance to optimize fuel efficiency on their vehicles along with building energy management procedures for its facilities. In addition, the City of Cambridge has an Idling Control Policy for staff while conducting corporate business.

The City of Kitchener

The City of Kitchener has a number of emission reduction initiatives associated with its Clean Air Plan such as energy conservation projects and energy efficient building design for corporate facilities, various air quality related public education programs as well as an Idling Control Policy for City staff. In fact, Kitchener won the national Repair Our Air Fleet Challenge last year, by placing first in the municipal category.

The Challenge is an annual program funded by Natural Resources Canada with the purpose of reducing vehicular exhaust emissions through efficient fuel management practices, in particular by reducing idling within an organizations vehicle fleet. A total of twenty-five fleets across Canada participated in the 2005 Repair Our Air Challenge.

With the use of specialized monitors, idling time was tracked as a percentage of total operating time. A total of 57 City of Kitchener employees operated ten vehicles with idling monitors during the Challenge over a three month period. Kitchener reduced idling to just 11 per cent of total operating time, which surpassed other municipal participants whose idling times ranged from 24 to 51 per cent.

The program has provided the City with some relevant data that will help them continue to reduce fleet idling in the future. Staff recognize idling as an area where they can achieve emission reductions that affect local air quality, while at the same time reducing the impact of the increasing price of fuel. Their success with reducing idling time is one of several fleet initiatives that the City uses to reduce emissions. This is important because transportation is a significant source of local air pollution.

The City of Waterloo

The City of Waterloo, through their Clean Air Plan and the Environmental Strategic Plan, continues to strive towards improved air quality. The most recently completed project is the implementation of 1660 metre green roof installation on City Hall. It is a lightweight vegetation blanket that adds many benefits compared to typical roofing. The listing below outlines some of the benefits we anticipate from the green roof from the Green Roof Feasibility Study which was funded from Federation of Canadian Municipalities:

Heat Island and Roof Condition

The temperature of the green roof can be up to 40 degrees F (20C) cooler than a comparative gravel surface roof. Roof surface temperature remains similar to the air temperature, suggesting that the air temperature will be lower than the existing condition, thus ameliorating the heat island effect. The addition of the green roof is also expected to extend the life of the newly installed underlying membrane by an additional 25 years.

Energy Savings

A specific energy analysis was done using the Xeroflor green roof system on the Waterloo Public Library. For the given roof coverage, an expected cost savings (in today's dollar) would have been approximately \$450.00 per year. Energy savings for the City Hall roof have not been quantified, but similar coverage would suggest that savings would be similar to those calculated for the Library building. The roof at City Hall also experienced improved insulation from an R-7 to R-20.

Air Pollution

The air pollution can be calculated to be improved by approximately 280 kg of particulate per year. For further information on the types of pollutants the plant species can absorb see: www.xeroflor.ca.



Conestoga College

With over 150 acres of land and facilities, Conestoga College has significant energy requirements for their lighting, heating, ventilation and air conditioning systems as well as their water use.

In 2005 the College completed a program to replace 17 heating and chilled water pumps with more efficient technology which uses 1/3 the horsepower based on demand. The new pumps also employ a mechanical seal rather than the old packing style, therefore no water or water treatment chemical are lost. This upgrade allowed chemical use to be reduced by 60 gallons and water consumption by several thousand gallons. The old pumps were not yet scheduled to be removed so this initiative recognized the value of accelerated replacement programs that allow facility operators an opportunity to take advantage of current technology and reduce air emissions with its lower energy requirements and water and treatments.

In addition, chilled water retrofit booster pumps were removed and 3 way valves blanked off and replaced with two primary pumps controlled by Variable Frequency Drives. This technology controls the speed of a pump or fan motor to regulate the proper air or water flow. This retrofit reduced our chilled water pumping requirements by about 100 horsepower and therefore reduces energy requirements.

The Region of Waterloo

The Region of Waterloo continually addresses air quality emissions from its operations via their Interdepartmental Clean Air Committee. Achievements in 2005 include:

- 95% of Grand River Transit buses and several Regional trucks equipped with pollution control equipment
- Smog day initiatives such as reduced lighting and heating in Regional buildings and free/2-for-1 Grand River Transit fares for the general public
- Installation of Light Emitting Diode technology on traffic lights which use approximately 85% less energy than standard traffic lights – this was done with \$320,000 in financial assistance from local utilities
- A pilot project involving a solar hot water heater at one of the Regionally operated daycare facilities
- An automated system installed in some of the 2500 social housing units operated by the Region which reduces heating when the unit is vacant – an initiative supported with \$285,000 from Cambridge/North Dumfries Hydro
- A new EMS Fleet Centre building which achieved Gold certification under the Leadership in Energy and Environmental design program, a 1st in Ontario

St. Mary's General Hospital

Having won several environmental awards in recent years, St. Mary's Hospital is a leader in their field while providing primary health care services to our community. Their activities related to air quality and reducing emissions include energy conservation education of staff, lighting retrofits, and anti-idling signage in several areas on premises.

St. Mary's also works with several partners to administer sustainable transportation initiatives for their employees which includes carpooling, car-sharing and a subsidized transit fare program. Partners for these initiatives include local organizations such as the People's Car Co-op as well as participating in the National Commuter Challenge event and the One-Tonne Challenge initiative.

St. Mary's greatest achievements in reducing their impact on air quality recently has been in the renovations of their facilities which house over 1200 employees. For example, upgraded elevators, new boilers and water softeners and window replacement has already resulted in 20% less energy use per year. Other energy/emission reduction measures being implemented include occupancy sensor lights and improvements to the heating, ventilation and air conditioning systems. These improvements are a part of a successful proposal to Natural Resources Canada developed by Enermodal Engineering for St. Mary's in order to take advantage of the Federal Energy Innovators program which provides grants for conservation measures in renovations and existing buildings.

Waterloo Region District School Board

The average school in Ontario uses 1.34 Gigajoules of energy per square meter of space (GJ/M₂). The average school within the jurisdiction of the Waterloo Region District School Board is 1.02 GJ/M₂. One of the ways this has been achieved is with motion and carbon dioxide sensors that trigger when heating, ventilation and air conditioning is required in portables in terms of detecting when people are present in those school structures. The next step will be to install the same type of sensors for lighting in various schools.

These energy saving measures are done initially as pilot projects so results can be evaluated before widespread expansion is considered. In addition, the School Board has extended its staff idling policy to apply to all courier and delivery contracts provided by a third party to the Board. The Environmental, Health & Safety Officer for the School Board will also assist individual schools wanting to develop similar policies where idling has been an expressed concern.

Wilfrid Laurier University

Wilfrid Laurier University has utilized a local building technologies firm to provide them with an Energy Services program which yields emission reduction initiatives primarily by reducing energy use in its many facilities. For example, almost 1.5 million Kilo-Watt hours will be saved via lighting retrofits in ten different student residential buildings for almost 5700 fixtures by using more energy efficient lamp bulbs and ballasts.

In addition, a major upgrade to the University's swimming pool complex is required due to significant degradation of the building caused by excessive humidity in normal operation of the aquatic facilities. The Assistant V.P. in charge of Physical resources is taking this opportunity to also upgrade lighting and improve almost the entire heating and ventilation system. Improvements include:

- Installation of a new dehumidifier which has a dual benefit of addressing high humidity levels as well as reduced gas energy usage
- Optimal use of a heat recovery ventilator which captures waste heat from washrooms, locker rooms and exercise rooms which can be used to heat the pool water
- Using a supplemental high-efficiency low Nitrogen Oxide hot water boiler which will result in over 8200 cubic metres less natural gas consumed per year

This is the third such energy performance review, measure and verify program that Wilfrid Laurier University has utilized over the past several years. This approach to managing the University's facilities allows them to manage budgetary constraints, utilize government grants for energy reductions, and achieve reasonable pay-back periods for most projects by having energy savings pay for capital improvements over time.

To download a copy of this report please visit the Region of Waterloo Public Health website:
www.region.waterloo.on.ca/ph or call 519-883-2008 for more information.